***Objectives of the assessment:***

- To help students enhance their understanding of warehouse operations, specifically, key inbound and outbound processes
- To help students understand the key functions of a warehouse management system and insights necessary from the system to facilitate managerial decision making
- To help students develop essential skills for managing and utilising master data and transactional data required for operations

***Key dates:***

Please note the new dates:

Details | Criteria

| Type | Description | Weight | Due | Length |
|---|---|---|---|---|
| **Small continuous assessment** | **Supply chain data standards** Oral and written presentation | 30% | - | Details available on Canvas |
| | Outcomes assessed: LO1 LO4 | | | |
| **Final exam (Take-home short release)** (D) | **Final exam** Written take-home exam | 40% | Formal exam period | 3 hours |
| | Outcomes assessed: LO1 LO2 LO3 | | | |
| **Assignment** | **Take-home quiz** Written take-home quiz | 30% | Week 11 | n/a |
| | Outcomes assessed: LO1 LO2 LO3 | | | |

= group assignment (?) (D) = Type D final exam (?)

**The due date in Week 11 is 11-Nov-2020.**

Online weekly consultations during the semester:

| Date | Time | Location |
|---|---|---|
| **Tuesdays**<br>**Thursdays**<br>**Fridays** | **16:00 - 17:00**<br>**17:00 - 18:00**<br>**17:00 - 18:00** | **Zoom link:**<br>https://uni-sydney.zoom.us/j/8168256120 |

***Assumed knowledge for the Take-Home Quiz:***

All content in the modules for Week 1 to Week 6 on Canvas.

***Take-home Quiz Case Description:***

Apromo Trading (http://apromotrading.com.au/about-apromo.php) is a small-to-medium sized business headquartered in Sydney. They supply European ingredients and semi-finished products to chocolate manufacturers, premium hotels and patisseries in Australia. They also supply gourmet food and packaged confectionery to department stores, confectionery retailers, independent grocers and delicatessens in Australia and New Zealand. The company has a small team of full-time staff in both Sydney and Melbourne (http://apromotrading.com.au/our-team.php).

The company has one warehouse in Sydney and a newer one in Melbourne (http://apromotrading.com.au/facilities.php). Assume both warehouses have approximately equal storage capacity. The warehouse operations are supported by dozens of part-time workers. The warehouses maintain areas at different temperatures based on the requirements for different product ranges. Temperatures are monitor and logged in line with HACCP food safety certification requirements.

The company imports two shipping containers and various plane shipments every week, and processes approximately 150 orders per day. Its delivery vans that are fully refrigerated and all temperatures are recorded at the time of delivery to ensure the products arrive in optimum condition. The vans service the CBD and inner suburbs daily and outlying areas weekly. Deliveries to regional customers are done via the dedicated cold chain freight company Kerry Logistics. Customers can also collect their orders from the warehouses.

With increasing order volumes, the company requires a system that will scale with growth and provide real-time item-level visibility, keep track of regulatory and food safety certification compliance. The existing warehouse management processes are manually recorded and prone to data entry errors. This leads to problems in order completion, lack of adequate visibility into items in stock and delays in order completion.

The company needs a WMS, but solutions from market leaders such as SAP are cost prohibitive and more complex than necessary for the company's operations. You have been hired as a supply chain specialist to design a scalable solution without requiring additional software investments. Given your training at the University of Sydney, you have been asked by your manager to design the solution using SQL Server Express.

You have been provided with some Excel data files by your manager to develop and test your solution and have been asked to create additional dummy data for demonstrating the system's capabilities. The Excel files contain the following data:

- Distributors and retailers for Apromo Trading.
- Ingredients and food service products carried by Apromo Trading.
- Retail products carried by Apromo Trading.

**Your WMS database design should include tables, data, a diagram and queries.**

You will need to create dummy (i.e., fake/placeholder data for testing purposes – this is common practice in operational database design) for tables that are necessary for your design but for which you have not received any data from your manager. In the Word document, you need to report any queries you used for creating dummy data.

It is important to be able monitor operational efficiencies in warehouses. You will need to create **five queries** to provide insights in relation to any five of the following eight monitoring concerns in logistics operations:

- **Order picking accuracy:** This metric shows how accurately warehouse employees pick products for orders.

- **On-time Shipments:** Shipments reaching customers on-time is a critical success metric for warehouses. It's important on its own, because it reflects if the warehouse doing its job right. However, late shipments also create hidden costs and difficulties elsewhere in the business. They cause customer service calls and complaints. They cause package tracking and other wastes of time. Ultimately, late shipments can damage your brand and cause customers to defect.

- **Receiving efficiency:** A warehouse operation all starts with receiving and booking in incoming stock. This may seem a pretty mundane area at first thought. But it can get tricky when considering it can involve receiving multiple new stock deliveries each week, customer returns of good items, customer returns of damaged items, or return to vendor stock.

- **On-time receipts from suppliers:** The percent of orders received from a supplier per on time requirements.

- **Lines put away per hour:** The number of orders put away per hour during an eight-hour working day.

- **Average warehouse capacity used:** The number of inventory storage locations with an on-hand quantity greater than zero, is divided by the total number of inventory storage locations.

- **Inventory count accuracy by location:** Are the inventory counts accurate in each location? This is another stealth issue that is more important than it looks. If there are fewer items in a bin than the system says there should be, that might indicate theft or unreported damage. The results of miscounted inventory include unforeseen stockouts and fulfillment problems that negatively customer attitudes.

- **Fill rate per line:** The fill quantity is calculated as the difference between the individual shipment line items after the completion, compared to the original requested shipment instruction line item quantity. The difference is then divided by the requested quantity and aggregated for all orders within the defined benchmarking period.

Please use the Word template provided to complete the take-home quiz.